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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/057,037 | 01/24/2002 | Laxman Muruges | 006383/CPS/CPS | 3454 |
| 32588 | 7590 | 12/04/2003 | EXAMINER | |
| APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050 | | | MARKOFF, ALEXANDER | |
| | | | ART UNIT | PAPER NUMBER |

1746

DATE MAILED: 12/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/057,037

Applicant(s)

MURUGESH ET AL

Examiner

Alexander Markoff

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2, 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to because they fail to comply with the requirements of 37 CFR 1.84. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are indefinite because it is not clear what is referenced as a byproduct of the process and how it is different from the products of the cleaning process.

Claims 1-10 are indefinite because it is not clear what is referenced as "a measure of absorbance of the radiation" and how can the "measure" be detected.

Claims 1-19 are also indefinite because how can the "radiation absorbed by a byproduct" be directed to an exhaust line.

Claims 1-10 are further indefinite because it is not clear what is referenced as "a predetermined window". For claim 2 it is further not clear how can this window corresponds to cleaning the chamber and the exhaust line.

Claim 2 is indefinite because it is not clear how can the specified by this claim "predetermined window be known for the specific cleaning process. Does the method require any additional steps, such as calibrating the controller prior to actual cleaning process? How can the points corresponding 100% of chamber cleaning and 100% of the exhaust line cleaning be determined or assumed having only absorbance data?

Claims 7-10 are indefinite because they contradict to claim 1, which require a different step for the same purpose of detecting endpoint. As the result, it is not clear how the endpoint should be determined.

Claim 8 is indefinite because it is not clear how this claim limits the subject matter of the preceding claim. This claim fails to recite any new processing step or specify the step recited by the preceding claim.

Claims 11-19 are indefinite because it is not clear what is referenced as "a measure of a background radiation".

Claims 11-19 are also indefinite because it is not clear how can the analyzer determines a measure of absorbance from the further radiation and background radiation.

Claims 11-19 are further indefinite because it is not clear what is meant under "the measure to determine a measure of absorbance".

Claims 11-19 are indefinite and incomplete because they omit essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: between the detector, the analyzer and the controller.

Claim 12 is indefinite and/or incomplete because it is not clear what structure is enables determination the points corresponding 100% of chamber cleaning and 100% of the exhaust line cleaning.

Claim 14 is indefinite because the term "close" is a relative term lacking proper comparative basis.

Claim 16 is indefinite because it is not clear which "measure" of the "measures" recited by the previous claims is meant.

Claims 17-19 are indefinite because they contradict to claim 11, which require different actions of the controller for the same purpose of detecting endpoint. As the result, the structure of the controller is not clear.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 11-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Hao (US Patent No 5,966,586).

Hao teaches an apparatus having the claimed structure. See entire reference, especially, Figures 3, 4a and column 2, and 5-10. The apparatus of Hao is fully capable of performing all the claimed functions.

Claim Rejections - 35 USC § 103

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hao (US Patent No 5,966,586) in view of WO 99/16108.

It is noted that the claims were interpreted in the light of the specification as directed to the method of cleaning process chambers.

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Hao teaches the claimed method except for determining the endpoint of the chamber cleaning process.

WO 99/16108 teaches a method of optical endpoint detection and teaches (page 3, line 31- page 4, line 6) that it was known to use the same endpoint detection methods for any plasma process including etching and chamber cleaning.

It would have been obvious to an ordinary artisan at the time the invention was made to use the method of Hao to determine endpoint of chamber cleaning process with reasonable expectation of adequate results because WO 99/16108 teaches that it was conventional to use the same methods for detection of endpoints of etching and chamber cleaning.

As to claim 5 Hao does not specify the use of Fourier Transform spectrometry. Hao teaches a number of optical methods, such as absorption, emission, combined, etc. It is believed that the disclosure of Hao encompasses Fourier Transform spectrometry.

On the other hand, WO 99/16108 teaches (at least on page 3, first paragraph) this method as a preferred optical method for end point control.

It would have been obvious to an ordinary artisan at the time the invention was made to employ Fourier Transform spectrometry in the method of Hao with reasonable expectation of adequate results because WO 99/16108 teaches this method as a preferred optical method for end point detection.

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Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 2002/0195423 is cited to show the state of the prior art with respect to methods and apparatuses for endpoint detection. See entire document especially Figures 1, 2, and the Endpoint Detection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Markoff whose telephone number is 703-308-7545. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P Gulakowski can be reached on 703-308-4333.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703--308-0651.



Alexander Markoff
Primary Examiner
Art Unit 1746

am

ALEXANDER MARKOFF
PRIMARY EXAMINER